OSWER Innovations Pilot

Building Deconstruction and Reuse

The Office of Solid Waste and Emergency Response (OSWER) Assistant Administrator Marianne Horinko in December 2001 initiated a series of innovative pilots to test new ideas and strategies for environmental and public health protection to make OSWER programs more efficient, effective, and user-friendly. A small amount of money is set aside to fund creative proposals submitted by OSWER Headquarters and Regional employees. EPA employees are encouraged to talk to States, Tribes, local governments and external stakeholders about proposal ideas and partner on a project. The creative projects test approaches to waste minimization, energy recovery, recycling, and land revitalization that may be replicated across various sectors, industries, communities, and regions. We hope these pilots will pave the way for programmatic and policy recommendations by demonstrating the environmental and economic benefits of creative, innovative approaches to the difficult environmental challenges we face today.

BACKGROUND

Construction activities consume 60% of the total raw materials used in the U.S. economy. EPA has estimated that 136 million tons of building-related construction and demolition (C&D) waste is generated in this country per year, of which 92% is from renovation and demolition. With the country's buildings rapidly aging and pressure to upgrade rising, this waste stream will only increase. While recycling of C&D debris is an important part of the solution, only 20-30% of C&D waste is currently recycled. Innovative reuse options are needed to preserve even more of the value incorporated in original buildings while saving more energy and producing fewer greenhouse gas emissions. A new deconstruction industry is emerging to meet this need.

Deconstruction is defined as "the disassembly of buildings so as to safely and efficiently maximize the reuse and recycling of their materials." While limited salvage is a standard demolition practice, deconstruction aims to increase reuse options by pushing materials salvage beyond the usual windows, doors, and light fixtures to include flooring, siding, roofing, and framing where these materials have retained their value. In some cases, deconstruction can generate items that are no longer available anywhere – such as the old-growth Douglas fir and redwood lumber that have been saved from closing military bases. While deconstruction has been growing, it remains a young industry that has not yet gained wide acceptance. To succeed, deconstruction needs to be developed to the point that industry and policy makers see it as a mainstream and intelligent alternative to demolition.

PILOT APPROACH

The University of Florida, in partnership with the U.S EPA Office of Solid Waste, U.S. EPA Region 4, the City of Gainesville, Gainesville Regional Utilities (GRU), and other partners will demonstrate the wide range of needs that can be met by a well-thought-out building reuse project. The pilot will conduct an innovative research, demonstration, and education project based upon the deconstruction of a typical wood-framed house in Gainesville, Florida, and the design and reconstruction of its constituent materials into new neighborhood building projects. The selected house is a prime candidate for deconstruction by virtue of its pre-WW II framing techniques and the quality materials. As a wood-framed house, it is representative of 94% of all residential buildings built in the U.S. The new community building design will demonstrate design for reuse of the existing building components and materials, while also taking into account the ultimate disposition of these materials when the new building reaches the end of its useful life.

The pilot will disseminate the results of this project to a wide audience to help replicate these results and bring this useful approach to building material reuse into the American mainstream.

INNOVATION

Deconstruction and design for reuse are innovative principles in need of broader demonstration so that they may be adopted by mainstream America. The proposed project is particularly unique in its simultaneous focus on the front end and the back end of the building process. The "grave-to-cradle" approach of this project deals with the issue of what to do with the enormous stock of existing buildings that are reaching the end of their useful lives. This proposal brings the two problems of old building waste and new building design together in one integrated project. Partnering with a community or municipal utility, such as GRU, increases incentives and opportunities to spread the message of the energy value of reuse to its customers.

BENEFITS

In the true spirit of sustainability, the pilot offers benefits both to the environment and to the community. It will divert a significant amount of waste that would otherwise end up in regional landfills. Using a conservative estimate of 60% recovery of materials, this project can be expected to divert upwards of 27 tons of waste. Reuse of these building materials will preserve the energy that was initially invested in the creation of the materials and reduce the need to extract new materials from the environment. The pilot will demonstrate design for reuse principles that, when adopted by the construction industry, can facilitate future reuse or adaptation of building materials. It will demonstrate and refine the practice of deconstruction, helping to make it more competitive with standard demolition.

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For additional information, visit the EPA OSWER Innovations web site at: www.epa.gov/oswer/IWG.htm.